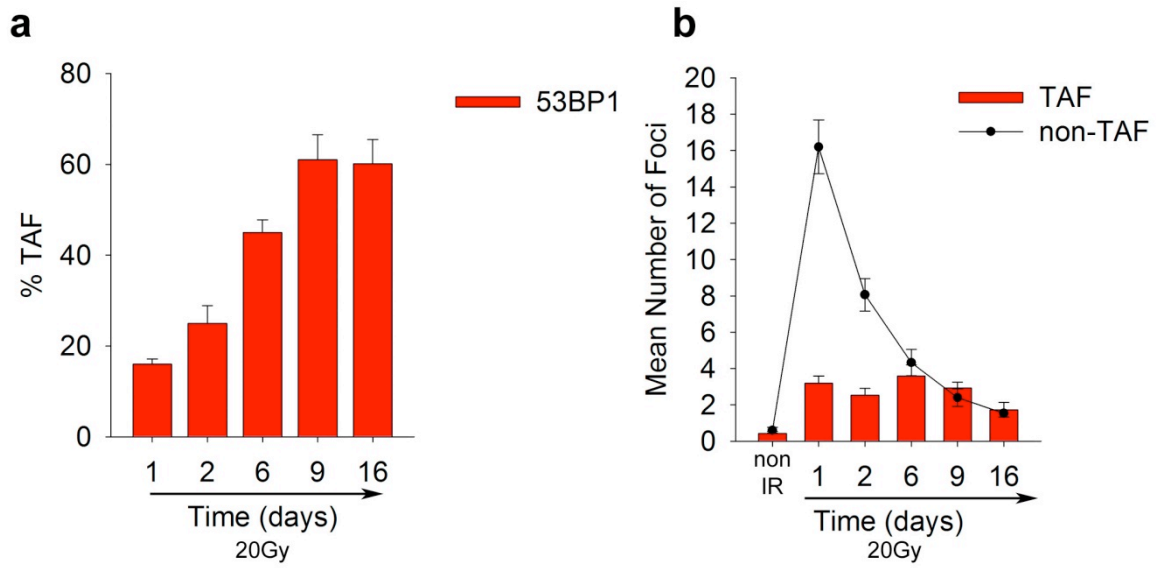
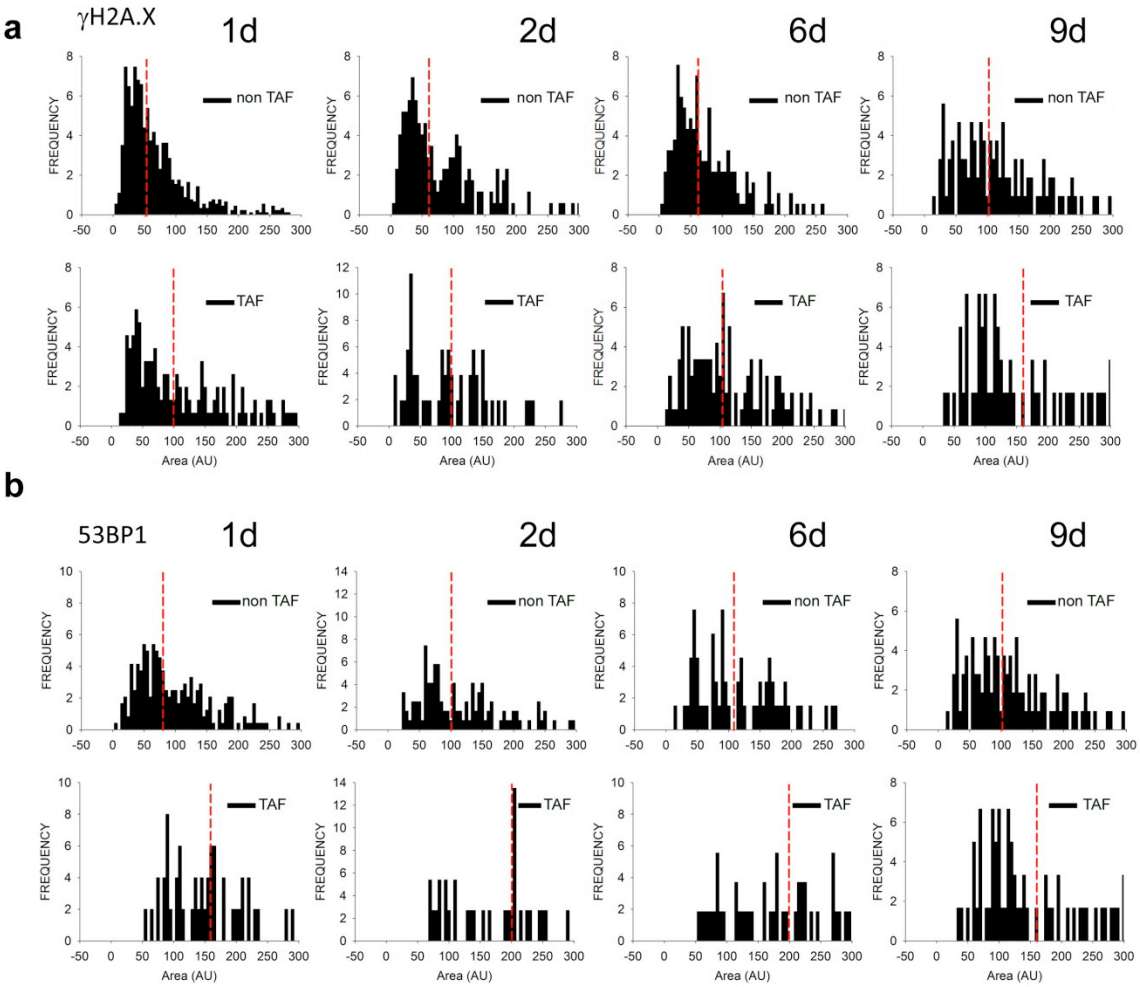
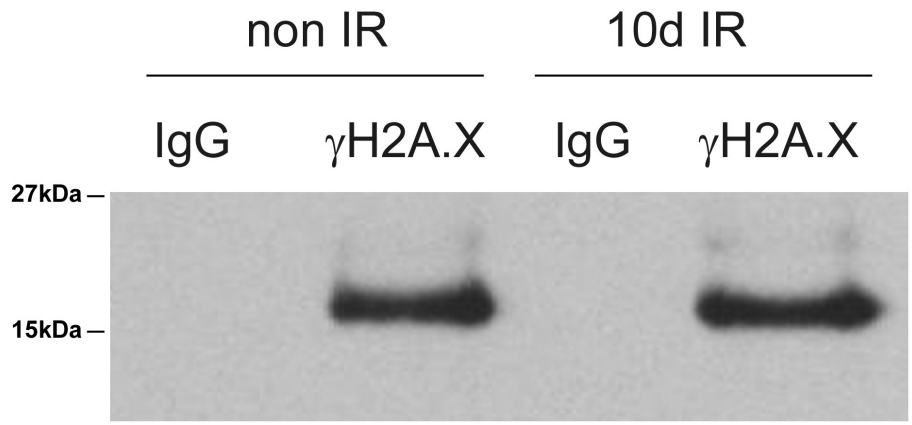
Supplementary information



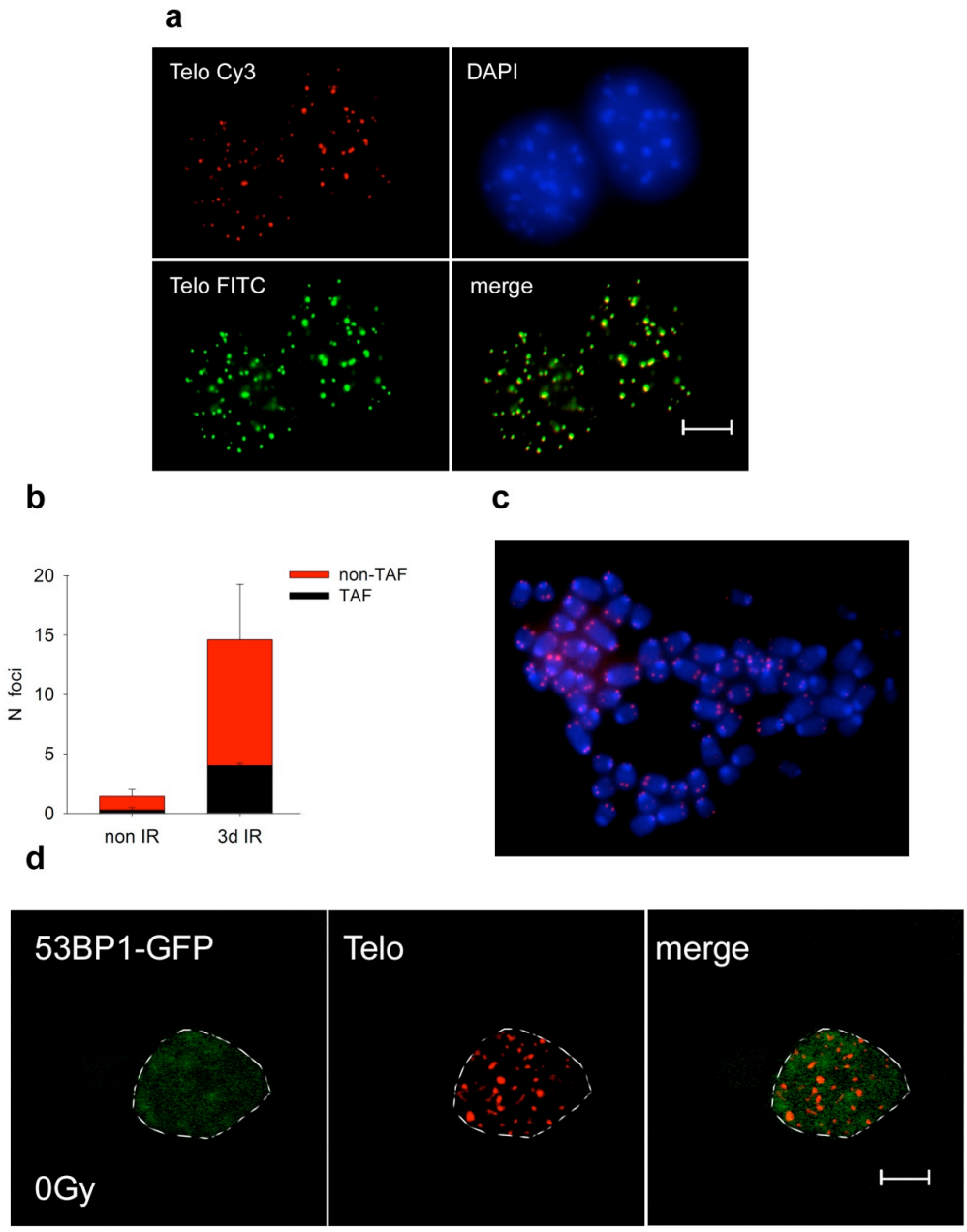
Supplementary Figure S1: Telomere-associated foci (TAF) are persistent following X-ray induced senescence in MRC5 fibroblasts. **(a)** Percentage of 53BP1 foci co-localising with telomeres (%TAF) in MRC5 fibroblasts up to 16 days after Irradiation with 20Gy; **(b)** Mean number of both TAF and non-TAF in MRC5 fibroblasts up to 16 days after Irradiation with 20Gy. Mean±S.E.M; n=15.



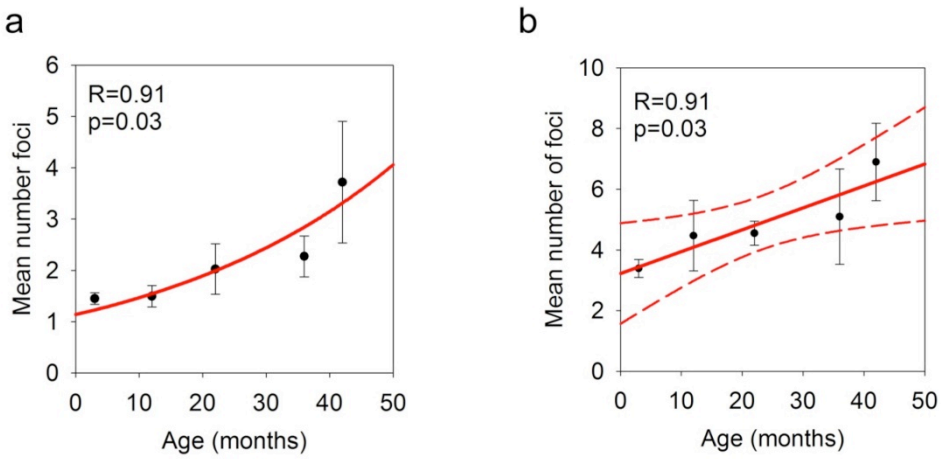
Supplementary Figure S2: Telomere-associated foci (TAF) have larger size than non Telomere-associated foci (non-TAF). Histograms representing distribution of foci size of γH2A.X **(a)** and 53BP1 **(b)** in MRC5 fibroblasts 1, 2, 6 and 9 days after Irradiation with 20Gy. Dotted red line represents median foci size. Between 100-200 foci were analysed per condition.



Supplementary Figure S3: Extraction of immunoprecipitated γH2A.X from phenol fractions of both non IR and 10d IR reveals specificity of ChIP assay. Western blot against γH2A.X in phenol fraction of immunoprecipitated γH2A.X and IgG in both non IR and 10 days after IR.



Supplementary Figure S4: Microbead mediated telomere PNA probe incorporation does not induce TAF and is telomere specific**. (a)** After incorporation Cy3 labelled telomere PNA probe in live MEFs, cells were fixed with 2% PFA and hybridised with a FITC labelled telomere probe. Images reveal that majority of red and green spots co-localize Scale bar = 5μm; **(b)** Quantification of TAF and non-TAF in non-IR and 3 days following IR in MEFs transfected with AcGFP-53BP1c fusion protein. Data are mean±S.E.M n=8; **(c)** After incorporation Cy3 labelled telomere PNA probe in live MEFs, cells were incubated for 2 hours in 10μg/ml Colcemid to generate metaphase spreads and then fixed. Image shows that telomere signals can only be found at chromosome ends; **(d)** Mouse embryonic fibroblasts (MEFs) transfected with AcGFP-53BP1c fusion protein show diffuse 53BP1 staining 2 to 8h following microbead incorporation of Cy3 labelled telomere PNA probe; Scale bar = 5μm.



Supplementary Figure S5: Mean number of γH2A.X foci per cell increases with age in both hepatocytes and small intestine crypt enterocytes. **(a)** Mean number of γH2A.X foci per cell in hepatocytes as a function of age (exponential curve -red- provides best fit, R=0.91;*P*=0.03; mean±S.E.M of n=3 per group); **(b)** Mean number of γH2A.X foci per cell in small intestinal crypt enterocytes with age (linear curve provides best fit, R=0.91; *P*=0.03; mean±S.E.M of n=3 per group; linear regression-red line, 95% confidence intervals –dotted red lines.